REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 1, 5, 8, 12 and 13 have been amended. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1, 4,-5, 7-8, and 11-13 are pending and under consideration. Reconsideration is respectfully requested.

ENTRY OF RESPONSE UNDER 37 C.F.R. §1.116:

Applicants request entry of this Rule 116 Response and Request for Reconsideration because:

(a) it is believed that the amendments of claims 1, 5, 8, 12 and 13 put this application into condition for allowance;

(b) the amendments were not earlier presented because the Applicants believed in good faith that the cited prior art did not disclose the present invention as previously claimed;

(c) the amendments of claims 1, 5, 8, 12 and 13 should not entail any further search by the Examiner since no new features are being added or no new issues are being raised; and/or

(d) the amendments place the application at least into a better form for appeal. No new features or new issues are being raised.

The Manual of Patent Examining Procedures sets forth in §714.12 that "[a]ny amendment that would place the case either in condition for allowance or in better form for appeal may be entered." (Underlining added for emphasis) Moreover, §714.13 sets forth that "[t]he Proposed Amendment should be given sufficient consideration to determine whether the claims are in condition for allowance and/or whether the issues on appeal are simplified." The Manual of Patent Examining Procedures further articulates that the reason for any non-entry should be explained expressly in the Advisory Action.

REJECTION UNDER 35 U.S.C. §102:

In the Office Action, at page 2 and 3-4, claim 12 was rejected under 35 U.S.C. §102((b) as being anticipated by Petzold et al. (WO99/45643; hereafter, Petzold). This rejection is traversed and reconsideration is requested.

The core of the present invention does not have a gap and yet has good DC current superposition characteristics and a high permeability reaching as high as 2700 (see Fig. 8 of the

present application). Thus, claim 12 has been amended to recite "non-gapped core."

It is respectfully submitted that Petzold recites (see claim 1): "*Low-pass filter for a diplexer for separating low frequency signals of analog communications systems from high frequency signals of digital communications systems, the low-pass filter comprising a plurality of longitudinal inductances connected in series, such longitudinal inductances (i) comprising* ***magnetic cores made of an amorphous or nanocrystalline alloy****, ... "* (emphasis added)

As clearly indicated in Table 2 of Petzold, all of the Petzold Fe-based (having a highest percent of Fe) alloys are "nanocrystalline" and all of the Petzold Co-based (i.e., having a highest percent of Co) alloys are "amorphous". As a matter of fact, the alloy $Fe_{73.5}Cu_1Nb_3Si_{15.5}B_7$ in Fig. 4 of Petzold is a nanocrystalline alloy substantially described in Yoshizawa et al. (US Patent 4,881,989) relating to nanocrystalline alloys containing fine crystalline particles, and therefore is not an amorphous alloy.

Amorphous and nanocrystalline alloys have attracted considerable attention due to their often unique magnetic, electronic, mechanical, chemical, optical and other properties.

The unique properties of amorphous alloys stem from the lack of long-range atomic order. The amorphous alloys do not exhibit magnetocrystalline anisotropy, whence some of the alloys are extremely magnetically soft. The absence of grain boundaries, which otherwise could pin the domain walls, also contributes to a low coercivity. Lack of grain boundaries is also one of the factors that makes some amorphous alloys more resistant towards corrosion; grain boundaries facilitate, due to their open structure, the diffusion of oxygen. Another factor is that the amorphous phase in many alloys is stabilized by B, P or Si, which are strong oxide formers and may be the source for surface passivation in the same way as chromium in stainless steel provides a protective layer against corrosion for the iron. Absence of lattice planes by which dislocations can be created and migrate yield high mechanical strength to amorphous alloys. This atomic disorder is also the reason for the high electrical resistance of amorphous alloys, which is useful in suppressing eddy currents in high frequency magnetic reversal applications. Amorphous alloys are relatively brittle and become more so with heat treatment.

Nanocrystalline alloys are routinely obtained by a controlled crystallization of amorphous precursors. That is, nanocrystalline magnetic alloys are derived from crystallizing amorphous alloy ribbons. Depending on their composition and annealing conditions, the resulting magnetic properties may vary. Nanocrystalline iron-based alloys obtained from heated melt spun amorphous ribbons typically crystallize into a block-centered-cubic (bcc) phase and exhibit excellent magnetic properties.

Fe based materials have a potential as lower cost alternatives to the costly Co-based amorphous materials in many applications.

Thus, it is respectfully submitted that differences between an amorphous and a

nanocrystalline alloy are well known to those skilled in the art. Based on these facts, an amorphous Fe-based alloy having a substantially constant permeability over a frequency range of about 1 to 1000 kHz is respectfully submitted not to be anticipated by the cited art. Hence, it is respectfully submitted that a **bandpass** filter based on the Fe-based amorphous alloy of the present invention is novel and patentable.

Although Petzold states " In addition it was found that **low-pass** filter chokes 9 for POTS splitters may also be made of some amorphous iron-based alloys (column 3, lines 48-51)," **bandpass** filters are not described. It is respectfully submitted that it is known to those skilled in the art that a **bandpass filter** has different characteristics when compared with a **low-pass** filter.

The Examiner refers to Fig. 5 of Petzold stating that this figure shows the permeability in a range of 400 to 1000 over a frequency range of 1 to 1000 kHz. By comparing Fig. 4 and Fig. 5 of Petzold, it is clear that the frequency dependences of μ_s' and μ_s" of nanocrystalline $Fe_{73.5}Cu_1Nb_3Si_{15.5}B_7$ having an initial permeability of 37,000 (line 29 in column 7) and amorphous $(CoFeNi)_{78.5}$ $(MnSiB)_{21.5}$ alloy having an initial permeability of 800 (line 34 in column 7) of Fig. 4 are shown in Fig. 5. Those skilled in the know that μ_s' (the real part of the permeability) is the same permeability depicted in Fig. 4. Thus, it is respectfully submitted that the Examiner's statement that Fig. 5 shows the permeability in a range of 400 to 1000 over a frequency range of 1 to 1000 kHz applies only to the Co-based amorphous alloy used in this permeability behavior comparison. In other words, Petzold did not demonstrate that an amorphous Fe-based alloy has a permeability in a range of 400 to 1000 over a frequency range of 1 to 1000 kHz.

In addition, in the U.S. Patent No. 6,559,808 of Petzold, which corresponds to WO99/45643, it recites: "These requirements may be met by small **unslit** toroidal tape cores made of an amorphous, nearly magnetostriction-free cobalt-based alloy or a practically magnetostriction-free fine crystalline alloy." (emphasis added) Hence, it is respectfully submitted that Petzold does not teach or suggest non-gapped cores.

Hence, it is respectfully submitted that claim 12 is not anticipated under 35 U.S.C. §102((b) by Petzold et al. (WO99/45643).

REJECTION UNDER 35 U.S.C. §103:

In the Office Action, at pages 2-4, claims 1, 4-5, 7-8, 11 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yoshihito et al. (UK 2,138,215; hereafter, Yoshihito) in view of Hilzinger et al. (USPN 4,812,181; hereafter, Hilzinger). The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

Independent claims 1, 5, 8, 12 and 13 have also been amended to recite that the core is non-gapped.

It is respectfully submitted that Yoshihito relates to a normal-mode noise filter having a gapped core (see Claim 1) showing a substantially constant permeability over a limited range of applied field and frequency in MHz range. The present invention does not require a gap in the core, as is recited in amended independent claims 1, 5, 8, 12 and 13 of the present invention.

Fig. 8 of Yoshihito shows an amorphous wound core with no gap having a permeability varying greatly with the applied DC field. Thus, Yoshihito teaches away from the present invention, which obtains permeability versus DC bias field, depicted for example in Fig. 4B of the present application. The substantially constant permeability for the DC bias field of less than 15 Oe, shown in Fig.4B of the present application, was not demonstrated for the non-gapped amorphous wound core in Fig. 8 of Yoshihito.

Claim 1 of Hilzinger recites " *A method for achieving a flat magnetization loop in a core wound of amorphous ribbon adaptable for use in a inductive component, said method comprising the steps of: subjecting said core to a long-term heat treatment of more than 10 hours at a temperature .....*" All of the flat magnetization loops depicted in Figs. 1-4 of Hilzinger show substantial loop openings near the center of the loops. These features are efficient enough for some magnetic inductive components Hilzinger envisaged, but are detrimental to **bandpass filters** of the present invention application because, as shown in Fig. 2A of the present invention, the basic bandpass filter circuit of the present invention has a resonance characteristic shown in Fig. 2B. To achieve an effective bandpass filter, the core material must have a linear BH magnetization loop as exemplified by Fig. 3 of the present invention application since the central resonance frequency must be constant with respect to the applied field and frequency. If the magnetization loop is non-linear with a substantial opening in the loop center as Hilzinger's Figs. 1-4 show, the bandpass filter's central frequency shifts with field and frequency and the filter's bandwidth (indicated by 'BW' in Fig.2B of the present invention) becomes blurred, making precise bandpass filtering difficult. This, in turn, results in cross-talks in the telecommunication lines, which must be strictly avoided. The 'flat magnetization loop' of Hilzinger is not the same as the linear BH magnetization loop of the present invention, and Hilzinger teaches away from achieving the linear BH magnetization loops in the cores of the present invention. Hilzinger includes '*a long-term heat treatment of more than 10 hours*' stated in Claim 1. This long-term heat treatment of Hilzinger certainly results in the flat and non-linear BH magnetization loops which must be avoided when fabricating cores for bandpass filters of the present invention. The heat treatment used in the present invention include heat-treatment temperatures of up to about 6 hours, well below more than 10 hours specified in Hilzinger.

The courts have held: "[t]he mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the

worker in the art, **without the benefit of appellant's specification**, to make the necessary changes in the reference device." See *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984) (emphasis added).

"When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references." In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453, 1456 (Fed. Cir. 1998) (citing In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987)). "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). Although the suggestion to combine references may flow from the nature of the problem, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), **"[d]efining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness**," (emphasis added) Monarch Knitting Mach. Corp. v. Sulzer Morat Gmbh, 139 F.3d 877, 880, 45 USPQ2d 1977, 1981 (Fed. Cir. 1998). Therefore, "[w]hen determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" In re Beattie, 974 F.2d 1309, 1311-12, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992) (quoting Lindemann, 730 F.2d at 1462, 221 USPQ at 488).

In this case, the Examiner appears to be using the present application as a blueprint, with Yoshihito as the main structural diagram, and looking to other prior art for the elements present in the present invention but missing from Yoshihito, which is respectfully submitted to be impermissible.

Thus, as explained above, it is respectfully submitted that amended independent claims 1, 5, 8, 12 and 13 are patentable under 35 U.S.C. §103(a) over Yoshihito et al. (UK 2,138,215) in view of Hilzinger et al. (USPN 4,812,181). Since claims 4, 7, and 11 depend from amended claims 1, 5, and 8, respectively, claims 4, 7, and 11 are submitted to be patentable under 35 U.S.C. §103(a) over Yoshihito et al. (UK 2,138,215) in view of Hilzinger et al. (USPN 4,812,181) for at least the reasons that amended claims 1, 5 and 8 are submitted to be patentable under 35 U.S.C. §103(a) over Yoshihito et al. (UK 2,138,215) in view of Hilzinger et al. (USPN 4,812,181).

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot. And further, that all pending claims patentably distinguish over the prior art. Thus, there being no further

outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited. At a minimum, this Amendment should be entered at least for purposes of Appeal as it either clarifies and/or narrows the issues for consideration by the Board.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited and possibly concluded by the Examiner contacting the undersigned attorney for a telephone interview to discuss any such remaining issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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